MISSOURI MONTHLY VITAL STATISTICS

Provisional Statistics

FROM THE

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Focus. . . Alzheimer's Disease Mortality

The number of deaths attributed to Alzheimer's disease in Missouri and nationally has increased markedly over recent years. (See Figure 1.) The number of Missouri resident Alzheimer's disease deaths in 1996 was 14.6 times the 1980 number; nationally, the increase was more than sixteenfold. If Alzheimer's disease had been counted separately as a leading cause of death in Missouri, it would have ranked eleventh in 1996 and tenth in 1997. Nationally, Alzheimer's disease moved from fourteenth in 1995 to thirteenth in 1996.

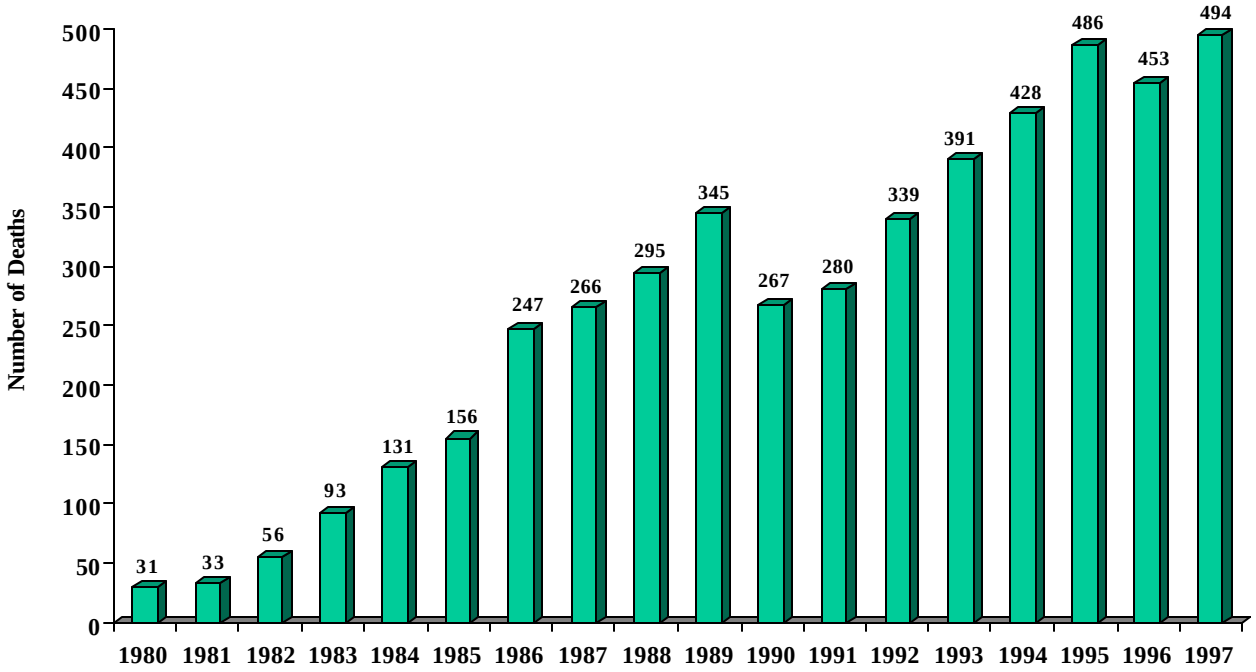
A study of the records from death certificates can tell us about patterns in this increase, and it provides explanations for some of the increase.

Alzheimer's disease (AD) is best known as a disease that progressively destroys memory. It acts both to destroy brain cells and to interrupt the communication among cells. Patients are not only forgetful and confused but may also have problems with judgment, delusions, unusual behaviors, and unstable moods. Eventually, patients become unable to care for themselves and are likely to become bedridden. They are increasingly vulnerable to infectious diseases; pneumonia is listed as having contributed to about seventeen percent of Missouri's AD deaths.

Alzheimer's disease is named for Alois Alzheimer, a German doctor who in 1906 discovered abnormal clumps and tangled bundles of fibers in the brain of a woman who had died of a dementia. Those plaques and tangles are now considered the definitive diagnostic signs of AD.[1]

AD is primarily a disease of the elderly. Of Missouri resident AD deaths in 1997, half (50.4 percent) were of persons over 85, and 99.0 percent were of persons over age 65. In that year, AD accounted for less than one percent (0.9) of all Missouri resident deaths, but 1.2 percent of deaths over age 65,

Figure 1
Missouri Resident Deaths Attributed to Alzheimer's Disease 1980-1997



and 1.6 percent of deaths over age 85.

Because AD is primarily a disease of the elderly, the fact that our population is aging is one explanation to consider as the cause of the increase in AD deaths. As death rates from other chronic diseases such as heart disease and cancer decline, more and more people live long enough to develop AD. Also, some persons who might have died of another disease while in early stages of AD now survive the other disease and die of AD.

In 1980, persons 85 years and older represented 1.2 percent of Missouri's population; in 1990, they were 1.6 percent, and estimates for 1997 are that they were 1.8 percent. The percent 75 and older went up from 5.4 percent in 1980 to an estimated 6.5 percent in 1997. Those increases are too small to explain much of the fourteenfold increase in AD deaths in Missouri between 1980 and 1996.

Figure 2 shows that the age group 85 and older has not only the largest rate of AD deaths, but also the largest increase in the AD death rate per 100,000 population. In the oldest age group, the AD death rate more than doubled between 1987 and 1997, from 112.2 to 262.7 (134.1 percent). The rate for persons 65 to 74 does not show a consistent trend over the past decade, while for ages 75 to 84 it increased 51.3 percent, from 49.1 to 74.3 per 100,000 population. For whatever reason, the increase in AD deaths is concentrated in the oldest of the elderly.

Figure 2 provides the answer to another question, as well: the role of gender. Since the beginning of 1980, 3,054 of the 4,791 Missouri residents whose deaths were attributed to AD have been female. That is 63.7 percent; a similar percentage of the deaths attributed to senility and other dementias were female. Does this reflect a higher death rate due to AD and similar conditions for females, or just that they are more likely to survive into the years of high risk for those conditions? Figure 2 shows that age is a far more important factor than gender, and females do not have consistently higher age-specific AD death rates. Indeed, national statistics showed a higher rate for males during the 1980's.[2]

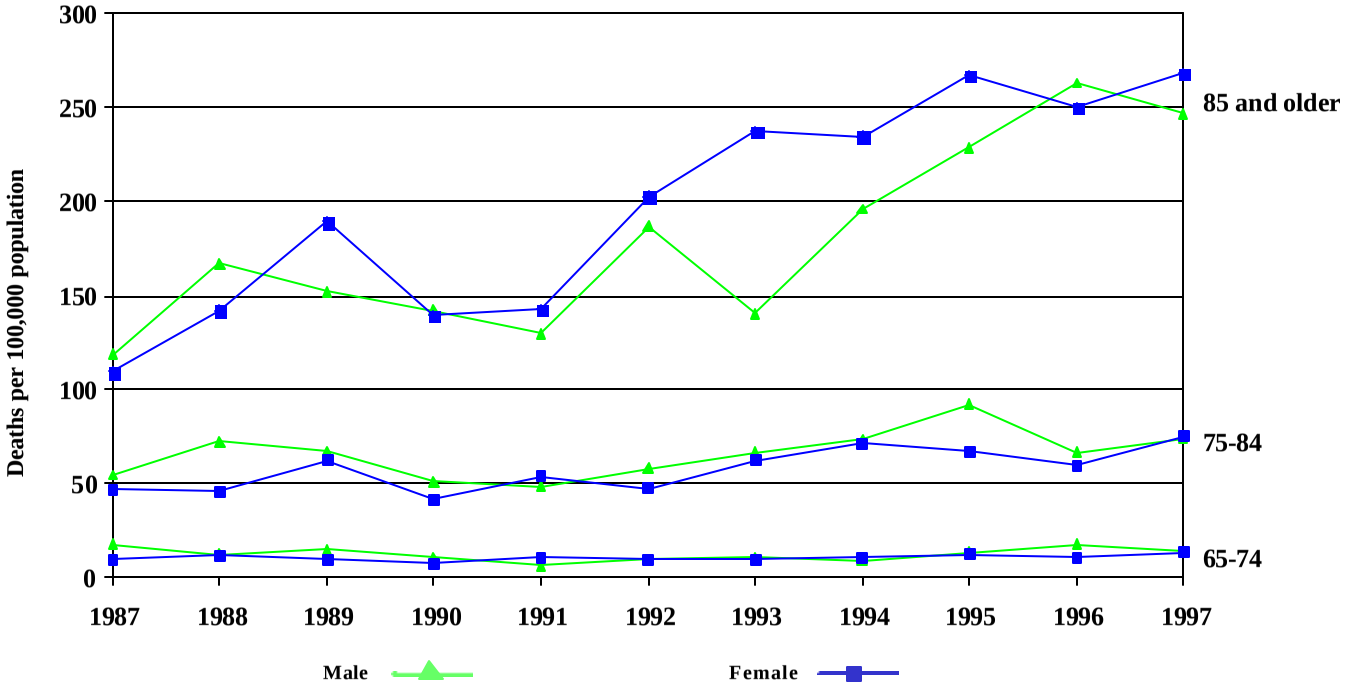
Another explanation to be considered is that doctors are becoming more likely to supply "Alzheimer's disease" as the cause of death in cases of dementia. As AD has become better known, doctors may also be more aware of it. Diagnostic tools are improving. Also, as certifying physicians who use vaguer terms such as "senility" are asked for more specific information, they may become more likely to supply "Alzheimer's disease."

However, Figure 3 shows that the number of deaths attributed to similar conditions (senility, presenile dementias and other cerebral degenerations) also increased sharply over the same time period. Clearly, the number of attributions of death to AD was not merely subtracted from those that otherwise would have been attributed to other dementias. However, there may be an increase in attributions to Alzheimer's disease for deaths that in earlier years would have been attributed to other kinds of diseases.

Although aging of the population and increased reporting may be contributing to the increase in AD deaths, there still may be other unrecognized reasons for the increase in deaths due to dementia in the elderly population.

Any increase in dementias among the elderly has implications for the future. The Bureau of the Census estimates that the number of Americans over age 85 will grow from about 4.4 million in the year 2001 to seven million in 2025 and 8.5 million in 2030.[3] Even without an increase in age-specific rates, an increasing number of elderly citizens leads to predic

Figure 2
Alzheimer's Disease Death Rates by Age and Gender
Missouri Residents 1987 - 1997



tions of increased numbers of persons with AD. Starting from an estimated prevalence of 2.32 million Americans with AD in 1997 (range: 1.09 to 4.58 million), growth due to aging alone would lead to estimates of about 2.89 million persons with AD by 2007 and 4.74 million by 2027.[4]

Although AD deaths tend to occur late in life, the suffering caused by the disease begins much earlier. Persons with AD typically live eight to ten years after onset, but may live much longer.[5] After the early stages, persons with AD are increasingly unable to care for themselves and need more and more concentrated care. One recent study estimated that in 1996 the annual costs of caring for persons with mild, moderate and severe AD were $18,408, $30,096, and $36,132, respectively.[6] Another study estimated costs of care for an AD patient in northern California at approximately $47,000 per year, including imputed value for unpaid informal care, as well as formal, institutional care.[7]

The cost of AD is not merely monetary. While elderly persons with other kinds of health problems are often still able to share their experience and wisdom as paid employees or volunteers, and especially as elders in their families and communities, persons with AD are far less able to do so. Often the disease absorbs large amounts of time and energy from unpaid family caregivers, who may pay a price in their own physical and mental health, jobs, and other relationships.

Missouri death certificate data reflect patients' need for more and more care in that 63.4 percent of Missouri deaths to those 85 and older due to AD and other senility/dementia take place in nursing homes (1990-1997), while the corresponding percentages for cancer and circulatory diseases were 41.1 percent and 44.2 percent, respectively.

Recent progress in treatment of AD includes identification of genes that may be associated with AD, and some studies that seem to indicate that onset of AD may be delayed by nonsteroidal anti-inflammatory drugs and by estrogen replacement in women. Results of studies are mixed, and there is no cure on the horizon.

The benefits of any even slightly effective treatment could be very significant, however. If a treatment were found that could delay onset by only one year, there would be nearly 210,000 fewer persons affected nationally after 10 years. At an estimated $47,000 per year, this would represent a national saving of nearly $10 billion including the cost of unpaid home care.[4] As expensive and debilitating as Alzheimer's disease is, even a small improvement in treatment could provide significant benefits to our increasingly elderly population.

[1]This paragraph is based on the "Alzheimer's Disease Fact Sheet" on the web site of the Alzheimer's Disease Education and Referral (ADEAR) Center: www.alzheimers.org/adfact.html

[2]Hoyert, Donna L., "Mortality Trends for Alzheimer's Disease, 1979-91," National Center for Health Statistics, *VitalHealth Statistics*, Series 20, No. 28, January 1996, p. 5.

[3]US Census Bureau; "Resident Population of the United States: Middle Series Projections" (Tables); published March 1996; www.census.gov/population/projections/nation/nas (accessed Nov. 18, 1998).

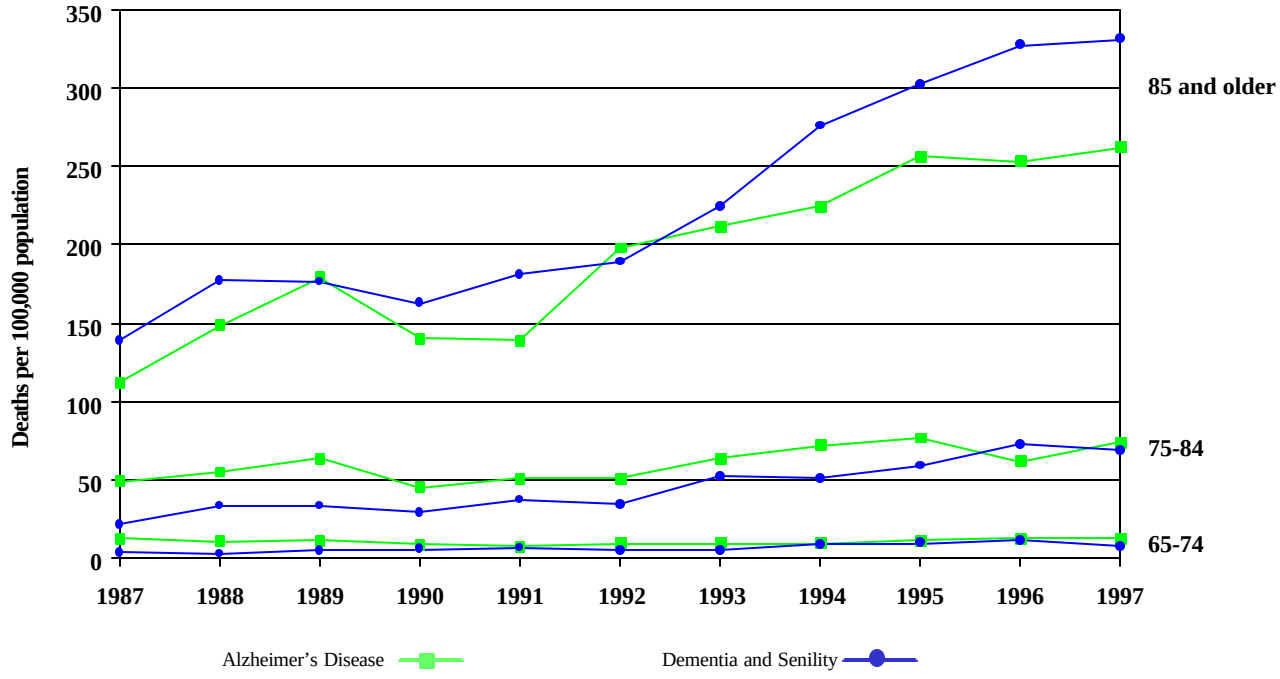
[4]Brookmeyer, Ron, Sarah Gray, and Claudia Kawas, "Projections of Alzheimer's Disease in the United States and the Public Health Impact of Delaying Disease Onset," *American Journal of Public Health*, Vol. 88, No. 9, September 1998, p.1340.

[5]US Dept. of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, *Clinical Practice Guideline Number 19: Recognition and Initial Assessment of Alzheimer's Disease and Related Dementias.*

[6]Leon, Joel, Chang-Kuo Cheng, and Peter J. Neumann, "Alzheimer's Disease Care: Costs and Potential Savings," *Health Affairs*, Vol. 17, No. 6 (Nov/Dec 1998), p. 206.

[7]Rice, Dorothy P., Patrick J. Fox, Wendy Max, Pamela A. Webber, David A. Lindeman, Walter W. Hauck, and Ernestine Segura, "The Economic Burden of Alzheimer's Disease Care," *Health Affairs*, Vol. 12, No. 2 (Summer 1993), p. 164.

Figure 3
Death Rates Due to Alzheimer's Disease and Other Forms of Dementia and Senility, by Age
Missouri Residents 1987 - 1997



Provisional Vital Statistics for August 1998

Live births increased in August as 5,908 babies were born compared with 5,750 one year earlier. Because of a longer reporting period in 1998, the rate actually decreased slightly during this time period from 12.5 to 12.4 per 1,000 population.

Cumulative births decreased for the 8 months ending with August, but increased for the 12 months ending with August.

Deaths increased in August, but decreased for the cumulative 8- and 12-month periods ending with August. Deaths decreased by 3.5 percent for the first eight months on 1998.

The **Natural increase** for Missouri in August was 1,378 (5,908 births minus 4,530 deaths) compared wtih 1,522 in August 1997. The rate of natural increase went down from 3.3 to 2.9 per 1,000 population during this period.

Marriages decreased for all three time periods shown below while **dissolutions of marriage** increased for all three periods. The marriage to divorce ratio for the 12 months ending with August decreased from 1.77 to 1.62.

Infant deaths decreased in August as 40 Missouri babies died compared with 43 one year earlier. The infant death rate for January-August increased from 8.0 to 8.4 per 1,000 live births.

PROVISIONAL RESIDENT VITAL STATISTICS FOR THE STATE OF MISSOURI

Item	August				Jan.-Aug. cumulative				12 months ending with August				
	Number		Rate*		Number		Rate*		Number			Rate*	
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1996	1997	1998
Live Births	5,750	5,908	12.5	12.4	49,143	48,947	13.7	13.5	72,842	74,385	13.6	13.5	13.7
Deaths	4,228	4,530	9.2	9.5	37,245	35,971	10.4	9.9	54,761	53,564	10.1	10.2	9.9
Natural increase	1,522	1,378	3.3	2.9	11,898	12,976	3.3	3.6	18,081	20,821	3.5	3.4	3.8
Marriages	4,773	4,754	10.4	10.0	29,836	28,278	8.3	7.8	44,717	42,254	8.4	8.3	7.8
Dissolutions	2,005	2,235	4.4	4.7	16,991	17,471	4.7	4.8	25,326	26,100	4.8	4.7	4.8
Infant deaths	43	40	7.5	6.8	395	411	8.0	8.4	600	584	7.4	8.2	7.9
Population base ..... (in thousands)	...	...	5,402	5,440	...	...	5,402	5,440	...	...	5,351	5,389	5,427

* Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.

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